Prime Hook NWR

PRESCRIBED FIRE PLAN

PROJECT NAME: Prime Hook Grasslands

PREPARED BY: _____ **DATE:** 2/24/14
Name & Qualification

TECHNICAL REVIEW BY: _____ **DATE:** 2/28/14
Name & Qualification

CONCURRENCE: _____ **DATE:** 3/5/2014
Biologist / Forester

REVIEWED: _____ **DATE:** 3/4/14
Zone FMO

REVIEWED: _____ **DATE:** 3/6/14
Regional Fire Management Coordinator

COMPLEXITY RATING: MODERATE

MINIMUM RXB REQUIREMENT: RXB2

APPROVED BY: _____ **DATE:** 3/21/14
Agency Administrator

This plan is valid for a period not to exceed three years from date of approval, subject to the following conditions:

The Agency Administrator Pre-ignition Approval Checklist must be approved by the Agency Administrator and the expiration date clearly indicated.

Any substantive alteration to the plan such as addition of a new burn unit, or changes in prescription parameters, holding/contingency resources, objectives, or complexity determination will require an amendment to the plan which must be approved by the Regional Fire Management Coordinator.

ELEMENT 2A
(PMS 485)
AGENCY ADMINISTRATOR GO/NO-GO PRE-IGNITION APPROVAL CHECKLIST

Instructions: The Agency Administrator Ignition Authorization must be completed before a prescribed fire can be implemented. If ignition of the prescribed fire is not initiated prior to expiration date determined by the agency administrator, a new authorization will be required.

Prior to signature the agency administrator should discuss the following key items with the fire management officer (FMO) or burn boss. Attach any additional instructions or discussion documentation (optional) to this document.

Key Discussion Items

A. Has anything changed since the Prescribed Fire Plan was approved or revalidated? *Such as drought or other climate indicators of increased risk, insect activity, new subdivisions/structures, smoke requirements, Complexity Analysis Rating.*
B. Have compliance requirements and pre-burn considerations been completed? *Such as preparation work, NEPA mitigation requirements, cultural, threatened and endangered species, smoke permits, state burn permits/authorizations.*
C. Can all of the elements and conditions specified in Prescribed Fire Plan be met? *Such as weather, scheduling, smoke management conditions, suitable prescription window, correct season, staffing and organization, safety considerations, etc.*
D. Are processes in place to ensure all internal and external notifications and media releases will be completed?
E. Have key agency staffs been fully briefed about the implementation of this prescribed fire?
F. Are there circumstances that could affect the successful implementation of the plan? *Such as preparedness level restrictions, resource availability, other prescribed fire or wildfire activity*
G. Have you communicated your expectations to the Burn Boss and FMO regarding if and when you are to be notified that contingency actions are being taken?
H. Have you communicated your expectations to the Burn Boss and FMO regarding decisions to declare the prescribed fire a wildfire?

Implementation Recommended by:
FMO or Prescribed Fire Burn Boss Signature: _____ Date: _____

I am authorizing ignition of this prescribed fire between the dates of_____ and_____ . It is my expectation that the project will be implemented within this time frame and as discussed and documented and attached to this plan. If the conditions we discussed change during this time frame, it is my expectation you will brief me on the circumstances and an updated authorization will be negotiated if necessary.

Additional Instructions or Discussion Documentation attached (Optional): Yes ☐ No☐
Ignition Authorized by:

Agency Administrator Signature and Title: _____ Date: _____

The expiration date will not extend beyond December 31 of the year of approval. Any burn implemented the following year must be accompanied by a new, approved Pre-ignition Checklist. All Pre-ignition Checklists will be attached to the burn plan and placed in refuge files.

ELEMENT 2B

PRESCRIBED FIRE GO/NO-GO CHECKLIST

Preliminary Questions	**Circle YES or NO**
A. Have conditions in or adjacent to the ignition unit changed, (for example: drought conditions or fuel loadings), which were not considered in the prescription development? If **NO** proceed with the Go/NO-GO Checklist below, if **YES** go to item B.	YES NO
B. Has the prescribed fire plan been reviewed and an amendment been approved; or has it been determined that no amendment is necessary? If **YES**, proceed with checklist below. If **NO, STOP: Implementation is not allowed. An amendment is needed.**	YES NO

GO/NO-GO Checklist	**Circle YES or NO**
Have ALL permits and clearances been obtained?	YES NO
Have ALL the required notifications been made?	YES NO
Have ALL the pre-burn considerations and preparation work identified in the prescribed fire plan been completed or addressed and checked?	YES NO
Have ALL required current and projected fire weather forecast been obtained and are they favorable?	YES NO
Are ALL prescription parameters met?	YES NO
Are ALL smoke management specifications met?	YES NO
Are ALL planned operations personnel and equipment on-site, available and operational?	YES NO
Has the availability of contingency resources applicable to today's implementation been checked and are they available?	YES NO
Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?	YES NO
If all the questions were answered "**YES**" proceed with a test fire. Document the current conditions, location and results. If any questions were answered "**NO**", DO NOT proceed with the test fire: Implementation is not allowed.	
After evaluating the test fire, in your judgment can the prescribed fire be carried out according to the prescribed fire plan and will it meet the planned objective? **Circle: YES or NO**	

Verbal communication with Agency Administrator or Designee must be documented below prior to ignition of the burn unit.

Burn Boss Signature: _____ Date: _____

Agency Administrator: _____ Date: _____

ELEMENT 3: COMPLEXITY ANALYSIS SUMMARY			
ELEMENT	RISK	POTENTIAL CONSEQUENCE	TECHNICAL DIFFICULTY
1. Potential for escape	LOW	MOD	LOW
2. The number and dependence of activities	LOW	LOW	LOW
3. Off-site Values	LOW	LOW	LOW
4 On-Site Values	LOW	LOW	LOW
5. Fire Behavior	LOW	LOW	LOW
6. Management organization	LOW	LOW	LOW
7. Public and political interest	LOW	LOW	LOW
8. Fire Treatment objectives	LOW	LOW	LOW
9 Constraints	LOW	LOW	LOW
10 Safety	LOW	LOW	LOW
11. Ignition procedures/methods	LOW	LOW	LOW
12. Interagency coordination	LOW	MOD	LOW
13. Project logistics	LOW	LOW	LOW
14 Smoke management	MOD	MOD	LOW

COMPLEXITY RATING SUMMARY	
	OVERALL RATING
RISK	MODERATE
CONSEQUENCES	MODERATE
TECHNICAL DIFFICULTY	LOW
SUMMARY COMPLEXITY DETERMINATION	MODERATE

RATIONALE: Treatment objectives are relatively simple, and easily achieved. Both fuel models can be treated with the same weather conditions. The terrain is flat; the intended fire will be mostly a backing, flanking fire through ground fuels. Offsite adjacent fuels are more of the same and can be readily extinguished. Water filling points are close by, directly adjacent to the burns. There is potential for negative smoke impacts, however, this should be mitigated through monitoring weather and smoke trajectory and can be shut down if unfavorable winds move smoke in wrong directions.

ELEMENT 4 DESCRIPTION OF PRESCRIBED FIRE AREA	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

PHYSICAL DESCRIPTION

Location: The grassland units are located within the general boundaries of the Prime Hook National Wildlife Refuge in Milton, Delaware. The grasslands units within this plan are found between Coastal Highway 1 to the west, Primehook Neck Rd. to the north and Highway 16/Broadkill Rd. to the south.

Lat/Long: N 38.829949 W -75.248392

Size: approximately 161 acres

Topography: Elevation is 4-10ft. and flat with 0% slope and calculated with a southern aspect.

PROJECT OR BURN UNIT BOUNDARY DESCRIPTION

1. Deep Branch road units 1 and 2 (Approx. 105 acres of grass). A paved road (Deep Branch Rd.) will serve as the west boundary and the rest of the fields are surrounded by woodlands or agricultural fields. The woodlands are predominantly a hardwood mix and will likely be too wet to be a factor should the fire escape. Control of a spot fire could be handled easily by a type 6 engines or UTV with water.
2. The Office Complex fields 318 and 321 (approximately 56 acres of grass) are divided by Turkle Pond Road. Both units will have firelines installed adjacent to the woods edge however there are several secondary roads and trail systems surrounding them that will serve as contingency lines.

FUELS DESCRIPTION

ON-SITE FUELS DATA	ADJACENT FUELS DATA
The fields are covered with herbaceous vegetation, small shrubs, grasses and/or phragmites. While the vegetation type may vary, all fields will exhibit Fuel Model 3 or Fuel Model 1 fire behavior.	Fuels outside of the burn treatment area consist of either more FM-3 and FM-1, or FM-8. The FM-8 (Loose hardwood litter) is usually very wet or damp during the winter and early spring months. The probability of ignition in this fuel type, during this time of year is very low. If the adjacent fuels are FM-3 or FM-1(short or tall grasses), the burn boss will use caution before leaving a burn area, to ensure no spot fires have crossed the control lines. Spot fires show up quickly in these Fuel Models, so the burn boss will scan the adjacent fuels before leaving.

DESCRIPTION OF UNIQUE FEATURES (hazards, regulations, issues, constraints, etc. Examples may include: fences to protect, power poles, historical/cultural sites, threatened and endangered species or habitat, etc.)

Special Features- Deep Branch road units have residences very close to the burn site. There is little chance of a burn escaping and making a run towards any residences, however, some homes may be temporarily impacted by smoke. There may be power lines near some of other burn sites. A thorough recon of the area before ignition should resolve any issues concerning power lines.

Smoke Management- Regardless of wind direction, units located near residential areas will require good lift and mixing heights as well as good dispersion. Ignition techniques should maximize heat generated and minimize burn duration. The Deep Branch Road units will not be burned with any easterly wind component due to the proximity of Highway 1 less than 0.5 miles west of the burn units.

ELEMENT 5 GOALS AND OBJECTIVES	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

PURPOSE AND RESOURCE MANAGEMENT GOALS:

1) Reduce the risk of wildfire through hazard fuel management. Implementing the above treatment(s) will reduce to an acceptable level the hazard fuel buildup within the units, thus reducing the threat to refuge resources and neighboring private lands in case of a wildfire.
2) Stimulate soil improvement and increased vigor in plant communities. Perpetuate the biological diversity and integrity of the refuge and enhance grassland communities to provide nesting and migratory habitat for ground nesting birds
3) Limit woody shrub encroachment through various management techniques, such as mowing as often as needed, use of the hydro ax, and the use of prescribed fire on a three to five year rotation.
4) Manage rare plant sites and natural communities to insure their viability is sustained over time and they continue to contribute to the natural botanical diversity of the area.

RESOURCE AND PRESCRIBED FIRE OBJECTIVES

RESOURCE OBJECTIVES:

Resource Fire Objectives:

1. Reduce competition from woody plant species. Keep undesirable plants from encroaching upon grasslands.
2. Remove exotic species.
3. Prepare fields for planting/ spraying or surveying

PRESCRIBED FIRE OBJECTIVES:

Fire Operations Objectives:

1. Provide for firefighter and public safety.
2. No smoke-related incidents on local transportation corridors or private dwellings.
3. Complete consumption of fuels with a burn vs. unburned ratio of 90%/ 10%, or greater is desired.

OBJECTIVES ARE S.M.A.R.T.	Specific Measurable Attainable Reasonable Time Related

ELEMENT 6 FUNDING	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

PRESCRIBED FIRE PHASE:	FUNDING SOURCE:	COST:
Planning	HFR	$1,000.00
Preparation	HFR	$1,000.00
Execution	HFR	$3,000.00
Evaluation	HFR	$500.00
TOTAL OF ALL ESTIMATED COSTS:		**$5,500.00**

ELEMENT 7 PRESCRIPTION: ENVIRONMENTAL PARAMETERS	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	
	PRESCRIPTION COVERAGE:	Broadcast burn Year round FM 1 and 3

DESCRIPTION OF ENVIRONMENTAL PARAMETERS NEEDED TO PRODUCE THE DESIRED FIRE BEHAVIOR	Fuels Within the Project or Burn Unit Boundary		Fuels Outside of The Project or Burn Unit Boundary	
	Low Fire Intensity	High Fire Intensity	Adjacent (FM 8)	Max. Spot Distance
Temperature	20 F	80' F	See below	See below
Relative Humidity	65 %	15 %		
Wind Speed (20' Forecasted)	5 mph	20 mph		
Wind Speed (mid-flame)	2 mph	10 mph		
Wind Direction (mid-flame)	-Deep Branch road units- **NW, W, SW, S** -Office complex units- **Any** See Smoke Management element 19 for more details			
Cloud Cover (%)	100 %	0 %		
1 Hr. Fuel Moisture (%)	15	4		
10 Hr. Fuel Moisture (%)	16	10		
Live Fuel Moisture (%)	90 (2/3 green)	30 (cured)		
KBDI	0	450		
Mixing Height	1700			

Environmental parameters discussion, or description of empirical evidence utilized:

Fuels outside the burn units are generally more grass fields, mixed forest or brush. Potential spotting is short distance, and usually not an issue in short grass fuels. The flanks of the unit are blacklined and secured ahead of the strip firing, so any spots that are generated usually land within the unit. The Burn Boss will discuss the location of natural barriers and secondary lines that could be used to stop an escape during the pre burn briefing. Obviously, a combination of 2 or more high intensity parameters will require the Burn Boss to examine the Behave runs closely and then look at all factors (contingency forces, ignition techniques, weather forecast, etc.) before deciding to proceed.

DESCRIPTION OF PRESCRIBED FIRE BEHAVIOR CHARACTERISTICS NEEDED TO MEET THE RESOURCE MANAGEMENT OBJECTIVES STATED IN THE OBJECTIVES SECTION: Fill-in all applicable fire behavior parameters (flame lengths, rate of spread, scorch height, ERC, etc.) for this fuel model. Separate environmental prescriptions may be needed for multiple fuel model conditions, seasonal differences and/or types of ignition (black lining, underburning, broadcast, aerial ignition, etc.*	**Fire Behavior For Fuels Within the Project or Burn Unit Boundary**		**Fire Behavior For Fuels Outside the Project or Burn Unit Boundary**	
	Low Fire Intensity (Backing)	**High Fire Intensity (Strip Head)** " 0.00 " = suggested limits	**Adjacent (FM 8)**	**Max. Spot Distance** **(FM8 – 0.2 miles)**
Fuel Model 1				
Rate of Spread (chs. /hr.)	0.6 – 2.8	8.5 – "30.0"	0.5 – 4.7	
Fireline Intensity (BTU/ft/sec)	4 - 11	25 – "500"	1 – 16	
Flame Length (ft.)	0.4 – 1.4	2 – 8.1	0.5 – 1.6	
Burning Index (BI) NFDRS FM H	3	14	≤ 14	
Fuel Model 3				
Rate of Spread (chs. /hr.)	0.3 – 3.0	2.1 –"30.0"	0.5 – 4.7	
Fireline Intensity (BTU/ft/sec)	1 - 79	8 – "500"	1 – 16	
Flame Length (ft.)	0.5 – 3.4	1.2 – "8.0"	0.5 – 1.6	
Burning Index (BI) NFDRS FM H	3	14	≤ 14	

Fire Behavior outputs may be derived from BEHAVE models, nomograms, or historical/empirical evidence. Include modeling and/or empirical evidence documentation as an appendix or in the fire behavior narrative.

Fire Behavior Narrative or description of empirical evidence:

Note: Rate of spread is controlled through strip firing, and allowing fire to spread back against the wind, as much as possible (backing fire). Strips will be managed to attempt to keep ROS and FI within "suggested limits" listed above.
A test fire will be conducted on each burn day on each unit in order to evaluate fire behavior.

See Appendix – Behave Runs for further discussion and fire escape predictions. A two person IA engine crew has a production rate of 8 chs. / hr. and could easily contain any escape in FM 8 under these conditions.

ELEMENT 8: SCHEDULING	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

IGNITION TIMEFRAMES:

Prescribed fire could be applied during early fall to late spring to meet the current objectives. This will depend on concurrence of the Biologist, FMO and staff at Prime Hook NWR to match the burn windows and prescription criteria.

PROJECT DURATION:

These old field grassland burns can be completed in 1 burn period with no residual smokes. Exact duration depends on the size of the unit, number of personnel on the burn crew, and weather conditions.

CONSTRAINTS:

No burning will be done when a state burn ban has been enacted.

Regional and National Constraints are given in Interagency Standards for Fire and Fire Aviation Operations ("Red Book", updated annually). We will adhere to direction contained in Chapter 17-2 (2013 edition) therein. Specifically, at Planning Level IV and Planning Level V, Prescribed Fire implementation is restricted and reference is made to the National Interagency Mobilization Guide for details. The Red Book also states:

"***FWS**-National Preparedness Level 5 concurrence from Headquarters, Branch of Fire Management must be obtained utilizing Preparedness Level 5 Prescribed Fire Concurrence Form*". (Send to Regional Fire Mgt Coordinator for review and forwarding).

For Preparedness Level IV the Mob Guide, Chapter 20 pg. 51 (2013 edition) states:

> "*Prescribed fire application can be continued or be initiated if the proposed action is approved by an agency at the Regional or State Office level. This approval must be based on an assessment of risk, impacts of the proposed actions on Area resources and activities, and include feedback from the GMAC. The GMAC provides information or perspectives to agencies wishing to proceed with or implement a prescribed fire application. The final decision to implement resides with the implementing agency.*"

For Preparedness Level V the Mob Guide , Chapter 20 pg. 52-53 (2013 edition) states:

> "*Rx applications can be initiated or continued if the proposed action is approved by an agency at the Regional or State Office level and local resources are available to carry out the application without additional outside resource needs. This approval must be based on an assessment of risk, impacts of the proposed actions on Area resources and activities, and include feedback from the GMAC. The GMAC provides information or perspectives to agencies wishing to proceed with or implement a Rx application.*
>
> *For Rx applications to be initiated or continued that requires additional support of resources from outside the local unit or require resource ordering of an IMT or WFMT, a National MAC representative must assess risk and impacts of the proposed action and present to NMAC for review prior to proceeding. The final decision to implement resides with the implementing agency."*

Consideration of environmental, economic and social effects: In the area, prescribed burning, mainly debris burning is an accepted way of doing business on private lands. The Staff at the Refuge have burned in the past, with great success in achieving desired habitat conditions. There are no known economic effects, and the Refuge follows state listed open burning regulations. Holding efforts will focus on resource protection outside unit perimeters to minimize scorch and mortality to established vegetation.

The availability of funding to cover costs associated with the burns, including overtime for the burn crew, **may**

also be a constraint, based on Regional priorities. **It is a goal of the regional fire program not to have inadequate funding as a limiting factor. There are fund ceilings that must not be exceeded. Should additional funds beyond this ceiling level be needed, consult with Zone FMO.**

The big concern for any of these burns comes from smoke impacting highway 1 to the west. If the smoke begins to impact the highway, the burn will be shut down. Due to the short duration of most of the burns, smoke impacts should be minimal.

ELEMENT 9: PRE-BURN CONSIDERATIONS	**PROJECT NAME:**	**Prime Hook Grasslands**
	BURN UNIT NAME:	

ON AND OFF-SITE CONSIDERATIONS

ON SITE: Refuge to ensure fuel break are complete around units, **prior to the operational burn period due to the nature of long distance mobilization,** which allows for easy ATV access and foot travel. Consideration will be given to utilizing wet line holding tactics but tractor with bush hog may be used in advance if needed The Burn Boss is also expected to inspect the perimeter of each unit prior to ignition, to identify any potential problem areas (corners with swirling winds, patches of heavy fuels, etc.) requiring special holding needs. This information will be discussed during the pre-burn briefing. The Burn Boss, Holding Specialist, and Ignition Specialist, if used, are responsible for reviewing prescription parameters and verifying with on site weather and fuel observations. Consideration will include the transportation of equipment (i.e. ATV's, pumps and hose). Other equipment needed may include smoke warning signs that will be used along the road ways.

Firefighters are to establish drafting sources if required in advance of ignition on burn day(s). Deploy and fill Port-A-Tanks as needed. Ensure tanks and pumps on ATV's are operational in advance of burn day.

OFF SITE: Media Contacts: Prior to burn season, a news release will be prepared by Refuge staff. Sufficient public notification will be made by the Prime Hook NWR staff in the form of a news release or calling local town offices and municipalities, state, and federal agencies prior to burning. Contact with the following media will be made prior to the burn day:

Channel 16 News	(302)-734-9262
Channel 47 News	(410)-742-4747
Cape Gazette	(302)-645-7700
State News	(302)-741-8229

Notification will be given to the Sussex County emergency dispatch center (911) on burn day. They will disseminate the information to all local cooperators. Individual notification may also be given to:

Delaware State Forestry	(302)-856-2893
City of Milton Police/Fire	(302)-684-4989

METHOD AND FREQUENCY FOR OBTAINING WEATHER FORECAST(S):

The Burn Boss will monitor fire danger indices. On burn day, the Burn Boss will be responsible for obtaining current weather information. Information on transport wind direction, wind speed, mixing height, and weather predictions will be obtained from the following sources, at least one hour before ignition:

NWS Mt. Holly, NJ email- http://www.erh.noaa.gov/er/phi/
Forecast Office Phone: 609-261-6602

Weather information will be verified with a belt weather kit during the burn and will be recorded on the forecast form and attached to this plan. A test fire will also be used to monitor smoke dispersal prior to the ignition of the burn. Hourly weather observations will be recorded on site and broadcast over the radio for all personnel to hear.

Spot Weather Forecast: Request forecast day before or morning of burn day - Procedures for obtaining spot weather forecast:

Day before and day of Burn:
A.Collect fire weather data from the FTS weather station located on-site, or collect a spot weather forecast (using a belt weather kit) at the site of the burn

B.Call or e-mail the information to fire weather forecaster at the National Weather Service Mt Holly office.

C. Have the return fire weather spot forecast in hand and determine on the go-no-go checklist whether the forecast will meet prescription parameters.

NOTIFICATIONS:					
Who	**When***	**Phone Number and/or e-mail**	**Responsibility**	**Date**	**Method**
NWS Mt. Holly	**Burn day**	**609-261-6602**	**Burn boss**		**Phone, computer**
DE Forest Service	**Burn day**	**302-856-2893**	**Local unit**		**FAX**
Milton Police/Fire	**Burn day**	**302-684-4989 /911**	**Local unit**		**phone**
Channel 16 News	**1 day prior to burn**	**302-734-9262**	**Local unit**		**In Person**
Channel 47 News	**1 day prior to burn**	**410-742-4747**	**Local unit**		Phone
Cape Gazette	**1 day prior to burn**	**302-645-7700**	**Local unit**		Phone
State News	**1 day prior to burn**	**302-741-8229**	**Local unit**		**Cell Phone**
Glen Stratton, Regional Fire Mgt. Coordinator	**Prior to all burns**	**413-253-8589 (O) 413-362-9119 (C)**	**Burn Boss**		**e-mail or phone**

ELEMENT 10: Pre burn Briefing Outline	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

I. Handouts:

_____A. Map of Burn
_____B. Organization Chart (If needed)

BURN NAME **Prime Hook unit**

II. Description of Burn Area

DATE ____/___/20_____

_____A. Objectives
_____B. Vegetation Type
_____C. Acreage
_____D. Slope
_____E. Roads/Access
_____F. Values at Risk
_____G. Water Sources
_____H. Natural/Manmade Barriers

Burn Boss _____

III. Expected Weather & Fire Behavior

_____A. Wind Direction and Speed
_____B. Relative Humidity
_____C. Temperature
_____D. Predicted Weather Changes

IV. Burn Organization/Holding Plan/Contingency Plan

_____A. Organizational Chart/Position Assignments
_____B. Equipment Assignments
_____C. Other Resources
_____D. Escaped Fire Situations

V. Ignition Plan

_____A. Test Burn
_____B. Type and Sequence of Firing Patterns
_____C. Ignition Equipment

VI. Communications

_____A. Procedures/Chain of Command
_____B. Frequencies/Channels
_____1. Burn Crew
_____2. Refuge Dispatch
_____3. State Radio
_____4. Other

VII. Safety

_____A. Escape Routes
_____B. Safety Zones
_____C. Hazards
_____D. Potential Problems
_____E. Smoke Management
_____F. Personal Protective Equipment
_____G. Refueling Procedures

VII. Wildfire Conversion

VII. Comments and Questions

ELEMENT 11: ORGANIZATION AND EQUIPMENT	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

Specify the minimum required implementation organization to meet the capabilities by position, equipment, and the supplies needed for the prescribed fire until declared out. Different organizations may be identified for different stages of implementation (i.e. holding v. mop-up and patrol, different ignition operations, different prescriptions).

Fire personnel may play multiple roles during fire operations. However in most cases the positions will be filled with single individuals. Assignments will be based upon availability of qualified personnel:

- Burn Boss, minimum qualification RXB2
- Firing Boss, minimum qualification FFT1
- Holding Boss, minimum qualification FFT1 and ICT5
- 3 or more firefighters, minimum qualification FFT2
- Type 6 engine or equivalent with a minimum of two operators, at least one of which is minimum ENOP qualified and is familiar with the equipment and with pumps and hose in general
- 2 UTVs with minimum 50 gallon mini pumpers
- 1,000 gallons of water (water tender, holding tank, or similar)
- Hand tools, portable pumps, hose

Minimum of 8 staff required for these burns.

A fully stocked Type 6 wildland engine with 4 x 4 capabilities and at least 2 portable pumps will be on scene for all burns along with 2 UTV's equipped spray tanks, 2 Drip Torches, and 10 gals. of drip fuel.

(ORGANIZATION AND EQUIPMENT continued)

NOTE: Departmental policy requires all personnel engaged in interagency wildland fire and/or prescribed fire operations to meet or exceed standards set by the National Wildfire Coordinating Group (NWCG) PMS 310-1. The Fish and Wildlife Service accepts NWCG standards for interagency operations. All employees; permanent, seasonal, and temporary will be qualified within the NWCG system for the position assigned, unless assigned as trainees. It is the responsibility of the Burn Boss to ensure compliance with this policy. **Per USFWS Fire Management Handbook , page 17-2: State, local cooperators, and contractors working on federal agency prescribed fires must meet the NWCG PMS 310-1 standards unless local agreements and / or contracts specify otherwise.**

ELEMENT 12: COMMUNICATIONS	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

Identify and assign command, tactical and air operations frequencies as needed.

Exact channels to be used will be determined on scene based on what resources are present or en route as well as expected incident complexity and duration.

	RX FREQ.	RX TONE	TX FREQ.	TX TONE	ASSIGNMENT	REMARKS
BWR Fire	162.2375	156.7	162.2375	156.7	Tactical Rx Ops	Primary Freq.
DE-FS					DE-DNR Operations	Backup to Rx Ops
Sussex County	800 mhz		800mhz		911 System	Separate radio
Air Grd	168.625		168.625	110.9	A/C Emergency/ 1st call	Must monitor
Fire Ops	173.7625	173.8	164.1625	173.8	Command	Contact Disp.

PROJECT PHONE NUMBERS

PERSONNEL NAME:	PHONE NUMBER:
Prime Hook NWR Headquarters	(302)-684-8419
Police/Fire	911
Delaware Forest Service	(302)- 856-2893
Beebee Medical Center	(302)-684-8545

ELEMENT 13: PUBLIC, PERSONNEL SAFETY	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

GENERAL PUBLIC AND PERSONNEL SAFETY MESSAGE:

Firefighter Safety

All personnel will be required to have necessary training, briefing, and PPE prior to their involvement in fire activities. All personnel will have common frequency radios, and will carry a spare battery in their gear during the burn. Escape routes will be discussed and the primary concern of crew safety will be emphasized. The unit is flat, therefore there should be no limitation of movement or visibility issues for burn team members. Good radio communication must be emphasized.

Public safety. All burn areas will be inspected prior to ignition, ensuring no unauthorized personnel are on the burn unit. If the fire creates a traffic problem, refuge personnel will be on hand to assist in keeping traffic moving and or serve as a public information officer.

MEASURES TAKEN TO REDUCE THE HAZARDS:

All personnel will be required to have necessary training, briefing, and PPE prior to their involvement in fire activities.

Escape routes will be discussed and the primary concern of crew safety will be emphasized.

Traffic control may be required at several locations during burning activities to protect the public as well as the staff. The Burn Boss will determine if and when traffic control is required. Refuge law enforcement personnel may be utilized to support this need. Signing will be installed along affected roadways as required to alert local drivers.

Frequent rest and water breaks are required.

Ground ignition will utilize 1-3 persons using drip torches to walk through vegetation along natural fire breaks such as creeks, ponds, highways, or along plowed or matted down fire lanes. These burns will generally utilize head fires burning away from control lines.

As the burn progresses, maintaining communication with the burn boss and regular checks with firing and holding crews is very important.

ELEMET 13: EMERGENCY MEDICAL PLAN	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

EMERGENCY FACILITIES:

Beebee medical center has an office on 524 Union St. (302)-684-8545. Milton VFD has EMT's and first responders available through the emergency call board. An expanded first aid kit will be available onsite for first responder treatment.

EMERGENCY EVACUATION:

Emergency Evacuation will be determined by on site EMS Personnel. If EMS is not required, the Burn Boss will determine if the injured party shall be transported to the nearest medical facility by the use of a government vehicle.

MEDICAL EMERGENCY PROCEDURES:

Milton VFD has EMT's and first responders available through the emergency call board. An expanded first aid kit will be available onsite for first responder treatment.

Should a medical emergency arise, the burn boss is capable of contacting the county 911 center via either radio or cell phone. If air transport is necessary the burn boss will determine the best location to meet the helicopter and pass this information on to the 911 center.

If the patient is capable of being transported via ground ambulance, the burn boss will make arrangements to have the patient either meet with an ambulance or some other form of ground transportation.

DIRECTIONS FROM NEAREST MEDICAL FACILITY TO PROJECT VIA GROUND:

Directions are to Prime Hook HQ.

North on Union St. to Hwy. 16 (Broadkill Rd.)

East. on Hwy 16 to Turkle Pond Rd. approx. 4 miles.

North on Turkle Pond Rd. to HQ.

ELEMENT 14: TEST FIRE	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

PLANNED LOCATION & SPECIFIC INSTRUCTIONS:

The test fire will be lit directly in the planned treatment area, in an area that can be easily controlled.
The burn boss will evaluate the fire behavior and fire effects and make the determination on whether or not to continue with the burn.

BURN DAY DOCUMENTATION

WEATHER CONDITIONS ONSITE:

Area/Unit	Date:	Time:	Temp:	RH:	WS:	WD:	Sky Cond.	ROS	FL

RESULTS OF TEST FIRE:

Does the test fire meet prescription parameters?	YES		NO		If "YES" proceed with burn operations

COMMENTS:

ELEMENT 15: IGNITION PLAN	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

NARRATIVE FOR IGNITION PLAN:

METHOD(S)*: Ignition will be accomplished by ground teams using drip torches. Wind direction at the time of ignition will dictate starting and ending points for ignition. Two fuel types are involved in this project, which may require some variance in techniques as the burn progresses. Tall grassland fuels (FM-3) typically produce higher flame lengths, greater intensities and greater rates of spread than short grass (FM-1), transitioning from one fuel type to another much be approached carefully, to achieve desired fire behavior

TECHNIQUES: The basic firing pattern will remain the same for both fuel types, with firing beginning off of the downwind line. Fire will be allowed to back into the wind off this line to a point sufficient to establish a secure black line. Firing will then be done using a strip/ head fire with the wind. Fire behavior will be observed, and observations will dictate the speed of the operation and the spacing of the igniters.

SEQUENCES: Up to three igniters will be used initially. That number may be increased or decreased, depending on observed fire behavior. Desired fire behavior is short duration head fire.

ANTICIPATED PATTERNS: : Strip –head firing, flank, backing

MINIMUM IGNITION STAFFING: 2

*Multiple prescriptions may require identifying and developing multiple ignition organizations and implementation instructions.

ELEMENT 16: HOLDING PLAN	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

GENERAL PROCEDURES NARRATIVE FOR PRESCRIBED FIRE HOLDING:

Equipment minimums for these burns shall consist of having on site the Type 6 engine, 2 UTV's equipped with 50 gallon sprayer tanks and sufficient hand tools for everyone involved. See "Organization and Equipment" for personnel needs on each unit.

General tactics will be to lay down a wet line along a unit's perimeter, as needed. In addition, all units will have a fuel break cleared of all woody debris. Ensure all water handling equipment is positioned and functioning. Ensure that hand tools are readily available, (for Lighters too). As the perimeter is fired, cool along the fuel break edge and watch for spots, outside and downwind of the unit. Once this line is extinguished, developing black line devoid of fuel will contain fire spread. Secure flanks by cold trailing and patrol as the ignition sequence progresses. Holders must also be aware of those areas outside the unit (the green) where fire can creep past the holding line or spot across the line. Holders must communicate the discovery of any spots to the Burn Boss and then aggressively attack fires outside the unit. The Burn Boss will determine if additional resources are required beyond the initial responders and if ignition should be suspended. Most parts of these burn units are only a short distance from the road and the perimeters are accessible with hose lays from an engine.

CRITICAL HOLDING POINTS AND MITIGATION ACTIONS:
Secondary containment lines, critical holding points and safety zones will be identified on individual unit maps and identified during briefing. Critical control problems are associated immediately along fuel break or fire lines. Where foam or water serves as a holding line, special attention will focus on these areas, to ensure no escape. Water will always be available; sources are close by. If refilling is necessary, the firing sequence is slowed down or stopped completely until water supplies are replenished and available.
GENERAL PROCEDURES NARRATIVE FOR PRESCRIBED FIRE MOP-UP AND PATROL:
Very little mop up is expected with light fuels, **50** feet in is required before leaving the unit. All personnel shall remain on-site working the perimeter until secured. Then attention is focused on the interior to ensure all woody debris, such as top killed brush, roots, and associated duff and litter, is completely extinguished. Once the last few scattered smokes have been extinguished, equipment breakdown can occur. One person is typically assigned to make a patrol sweep through the area downwind of the burn unit to verify there are no hidden spot fires. All fields burned will be checked for one to two days after, on a patrol basis, or until declared out by the Burn Boss.
PRESCRIBED FIRE DECLARED OUT BY:
The prescribed fire will be declared out by the Burn Boss when all areas of the burn are cold as determined by cold trailing. As a courtesy, local Fire Department should be notified all burning complete so if smoke reported they know it is not our burn.

ELEMENT 17	**PROJECT NAME:**	**Prime Hook Grasslands**
CONTINGENCY PLAN	**BURN UNIT NAME:**	
Management Action Points or Limits		**ACTIONS NEEDED:** Describe actions to be taken to ensure the prescribed fire stays within prescription.
Spotting into Adjacent area/unit		Burn Boss will evaluate if burning out or suppression using barriers and/or crew is required will stop the spread. If more resources are required to implement this action a call for assistance will be placed by the Burn Boss for assistance from the Delaware Forest Service and the closest Fire Department.
Smoke Impacts		Notify by Burn Boss or Refuge Law Enforcement Officer and the local Police of smoke impacts. Response is determined by the agency with jurisdiction. Burn Boss will evaluate if completion or suppression will be the quickest way to reduce smoke impact. If more resources are required to implement this action a call for assistance will be placed by the Burn Boss for assistance from the Delaware Forest Service and local Fire Department.
Out of Prescription		Suppress Fire. If more resources are required to implement this action a call for assistance will be placed by the Burn Boss for assistance.

Not achieving Objectives	Suppress Fire. If more resources are required to implement this action a call for assistance will be placed by the Burn Boss for assistance from the Delaware Forest Service and local Fire Department.

ADDITIONAL RESOURCES AND MAXIMUM RESPONSE TIME(S):

Plans may identify different levels of contingency needed for different stages of the burn, ignition through patrol. Verify availability of identified contingency resources on day of implementation.

Minimum required on-site contingency resources:

Resource Type:	Amount:	Response Time:
Engine - Type 6	1	On-Site NWR
UTV with 50 gallon pumper	1	On-Site NWR
ICT4	1	On-site NWR

***Minimum required off – site contingency resources and response times:**

Resource Type:	Amount:	Response Time:
Engine - Type 6 Delaware Forest Service or local fire department	2	15 mins

*Resources must be available throughout the burn duration.

Element 18: WILDFIRE CONVERSION	**PROJECT NAME:**	**Prime Hook Grasslands**
	BURN UNIT NAME:	

A prescribed fire will be declared a wildfire when the assigned Burn Boss determines that one or more of the following conditions or events has occurred or is likely to occur, and if these conditions cannot be mitigated within the next burning period by implementing the contingency actions in the prescribed fire plan by on-site holding forces and listed contingency resources staged during this operational period:

- The prescribed fire leaves the planned unit boundary.
- The fire behavior exceeds limits described in the prescribed fire plan and/or the fire is threatening to leave the planned unit boundary.
- The fire effects are unacceptable.
- Smoke production must be reduced because of adverse air quality impacts.
- Local and/or geographic area fire activity escalates and resources committed as contingency or holding forces are needed for re-assignment to other incidents.

After wildfire declaration, a prescribed fire project is over. A decision support document (WFDSS) can be developed to define appropriate future management action.

Actions

- When a prescribed fire is declared a wildland fire, managers still have the full range of suppression options available under the concept of the "Wildland Fire Response."
- When a prescribed fire is declared a wildland fire and Prescribed Fire Crewmembers are being utilized, regulations outlined in the *Fire Management Handbook, Chapter 1, pgs. 13-1and 13-2 "Prescribed Fire Fitness Exemptions";* must be followed.

WILFIRE DECLARED BY:

Who will make the decision that the fire has escaped

An escape will be declared a wildfire by the Burn Boss.

IC ASSIGNMENT:

Identify who will be the IC

The Burn Boss shall assume the role of Incident Commander (ICT4 or ICT5) during incident transition to wildland fire. Size-up, IA checklists, and other site specific information will be gathered by the IC to determine incident complexity and the suppression organization level needed, most likely a Type 4 or 3 organization. The primary role is gathering information, firefighter and public safety, control of fire resources arriving and deployed, and immediate threats to high value resources.

The incident complexity determines the minimal IC qualifications. If organizational needs exceed the IC qualifications of the burn boss, then the Milton Fire Department is to supply an IC. The next logical progression is for the Delaware Forest Service to assume command. At this point unified command will be established with the local FD or Delaware Forest Service, with the FWS IC filling line and agency advisor roles.

In all cases, the initial IC remains in control until:
1. Relieved by the Zone FMO or higher qualified FWS IC, or
2. Refuge Manager or FMO acting in his absence, delegates line officer authority IC responsibility to the Delaware Forest Service or Milton Fire Department.

The initial IC will brief the in-coming IC, and communicate to all initial attack resources, NECC and incoming resources that a change in command has occurred. The relieved IC will then become an available resource either filling a line role or other function upon consultation with the Refuge Manager or FMO.

NOTIFICATIONS:

Identify the notifications to be made and who will make them.

Burn Boss/IC will notify Agency Administrator, Zone FMO, and Regional Fire Management Coordinator.

EXTENDED ATTACK ACTIONS AND OPPORTUNITIES TO AID IN SUPPRESSION EFFORTS:

The status and availability of local and/or State fire suppression resources will be ascertained when courtesy contacts are made each burn day. This information will be used in the GO/NO-GO Checklist.

If wildfire incident complexity transitions to a type 3 organization (beyond capabilities above) then additional resources will be ordered (including ICT3) through the local Fire Department or NECC. This will be approved by the Refuge Manager or FMO acting on his behalf. A WFDSS will be developed by the FMO, assisted by the relieved IC, and approved by Refuge Manager. Current on scene personnel shall be deployed into the ICS organization based on individual qualifications and organizational needs. **Note: For extended attack actions (beyond first burning period) all deployed resources must meet NWCG PMS 310-1 position standards per Departmental policy for interagency operations.**

Element 19: SMOKE MANAGEMENT AND AIR QUALITY	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

COMPLIANCE: Describe how the project will comply with local community, County, State, Tribal, and Federal air quality regulations.

A burn permit will be obtained from the Delaware DEQ prior to initiating project. This plan does take into consideration smoke management.

IMPACTED AREAS:

Identify Class I air sheds, restricted areas, non-attainment areas (designated areas), and population centers that may be impacted.

The primary smoke sensitive areas are to the west and east and consist of the following areas:

-Housing community (Fowler Beach, Prime Hook Beach, Broadkill Beach) east of burn units– approx. ¾ to 2 miles

-Highway 1 west south/west – approximately .05 to 1.5 miles from burn units

SENSITIVE FEATURES AND RECEPTORS:

US Highway 1 on western edge of refuge

MITIGATION STRATIGIES AND TECHNIQUES TO REDUCE IMPACTS (If Applicable):

When burning the Deep Branch road field units' winds out of the north east, east or south east will not be allowed. When burning the Office Complex fields any wind direction is allowed as long as the smoke dispersion is good to excellent. If dispersion ratings are at Fair for the burn day no winds with an easterly component will be allowed for the Office complex fields.

Visual quality is expected to be negatively impacted throughout this burn. Projected time frame for ignition operations is under two hours. Burnout of 1 and 10-hour fuels in anticipated within two hours of completion of ignition operations.

Burning will be conducted as early in the day as possible to allow smoke dissipation before evening temperature inversions, and on days where mixing heights prevent smoke problems in populated areas. No ignition will occur under actual inversion conditions, or if adequate transport winds are not available to keep dense smoke aloft.

Smoke will also be mitigated by the ignition technique, which is designed to initially produce a low intensity backing fire. Once the backing fire has made the control lines safe, a series of strip head fires should speed the burn along and minimize smoke duration. The primary fuels targeted in the burn (mainly 1 hour) lend themselves to complete and rapid burn-out. Some residual burning is anticipated, and will be permitted to an extent to further project goals, however mop-up will be done in a timely manner, and as necessary to mitigate smoke problems.

Information regarding transport winds, direction, speed, mixing height can be obtained from the National Weather Service, and will be verified by on-site evaluation. A test fire will also serve to monitor smoke dispersal.

If residual smoke is a problem then Refuge personnel will take prompt action to ensure the safety of the public. This may include posting signs, using pilot vehicles, or closing the road entirely, until conditions improve. Traffic control on roads outside the Refuge will be conducted if necessary, in coordination with local fire and law enforcement personnel. Burning will be conducted during periods when rapid smoke dispersal will occur and will cease in adequate time to allow dispersal.

Element 20: MONITORING	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

MONITORING: Describe the monitoring that will be required for the prescribed fire. At a minimum specify the weather, fire behavior and fuels information (forecast and observed) and smoke dispersal monitoring required during all phases of the project and the procedures for acquiring it, including who and when.

Once ignition operations are completed, the fire will be allowed to burn down within interior areas to maximize fuel consumption. Control lines will be patrolled regularly to identify any problem areas. Any burning debris within 20 feet of the control line which may present a threat to the line will be extinguished as soon as practical. Cool to cold air temperatures, and expected relative humidity recovery to near 100% overnight should extinguish any residual burning, however a small monitoring crew may be left overnight, if fire activity warrants. Refuge law enforcement or fire personnel will monitor nearby roads for potential smoke impacts through the evening, as necessary.

The burn unit will be rechecked the following day, and fire activity will be re-accessed. At that point, further mop up will be conducted within the interior portions of the unit as needed, primarily to eliminate any smoke problems which may persist.

The refuge will be responsible for any post burn fire effects monitoring, to include determining if objectives have been met.

Element 21: POST-BURN ACTIVITIES	PROJECT NAME:	Prime Hook Grasslands
	BURN UNIT NAME:	

POST-BURN REPORT:

Prescribed fire reporting will include: burn day conditions, fire behavior, smoke dispersal, and first order fire effects.

At the conclusion of each days burn, the burn boss will complete a burn report using the approved Fire Management Information System (FMIS) format. This report will include a narrative summary of the prescribed burn, as well as a map(s) showing location of burn. The report will also include pertinent weather information, signed go-no-go sheets, and organizational charts or documentation showing which positions were filled and by whom.

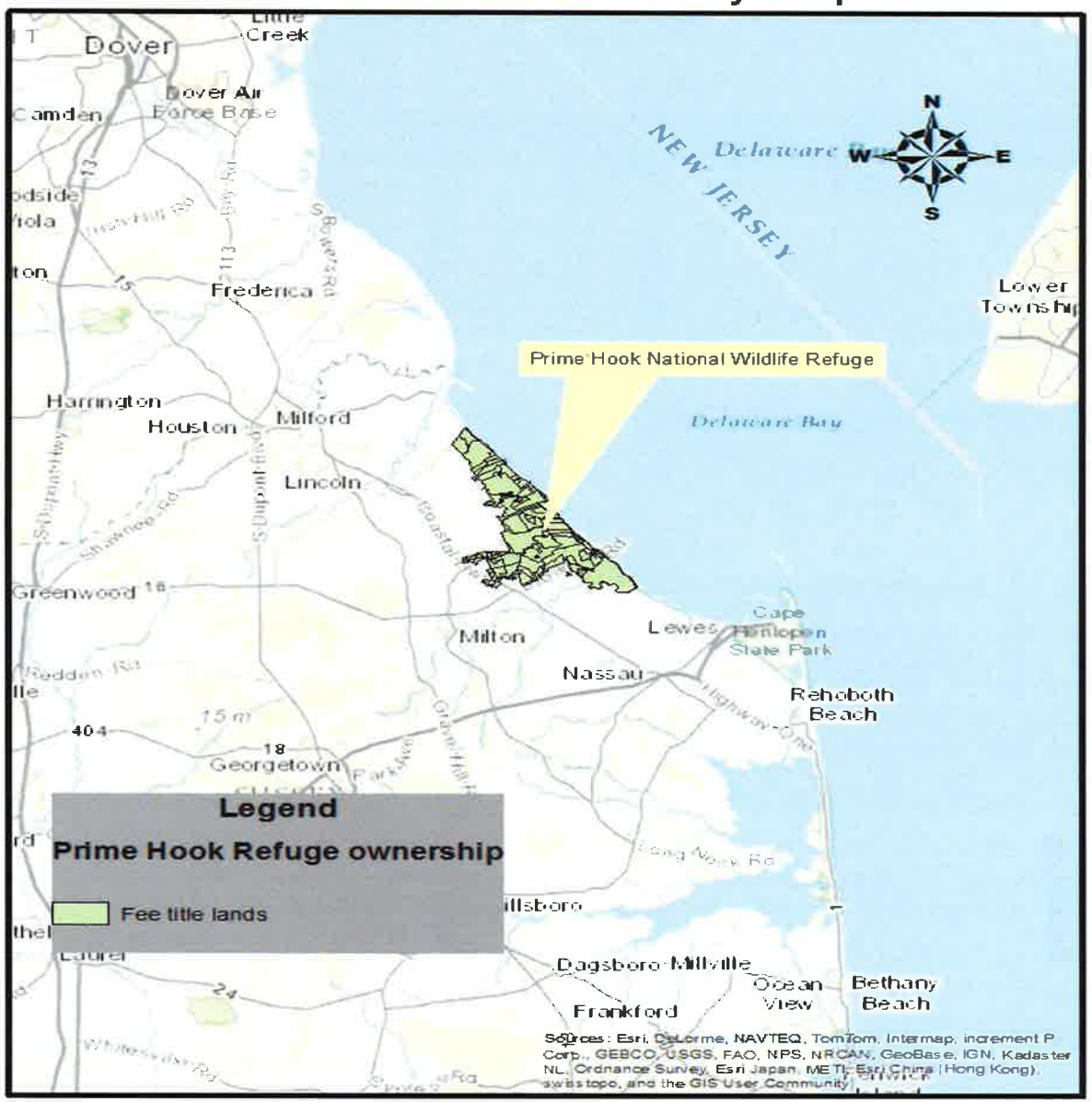
OTHER: Describe other post-burn activities that must be completed. This may include: safety mitigation measures, and rehabilitation needs including those as a result of pre-burn activities undertaken.

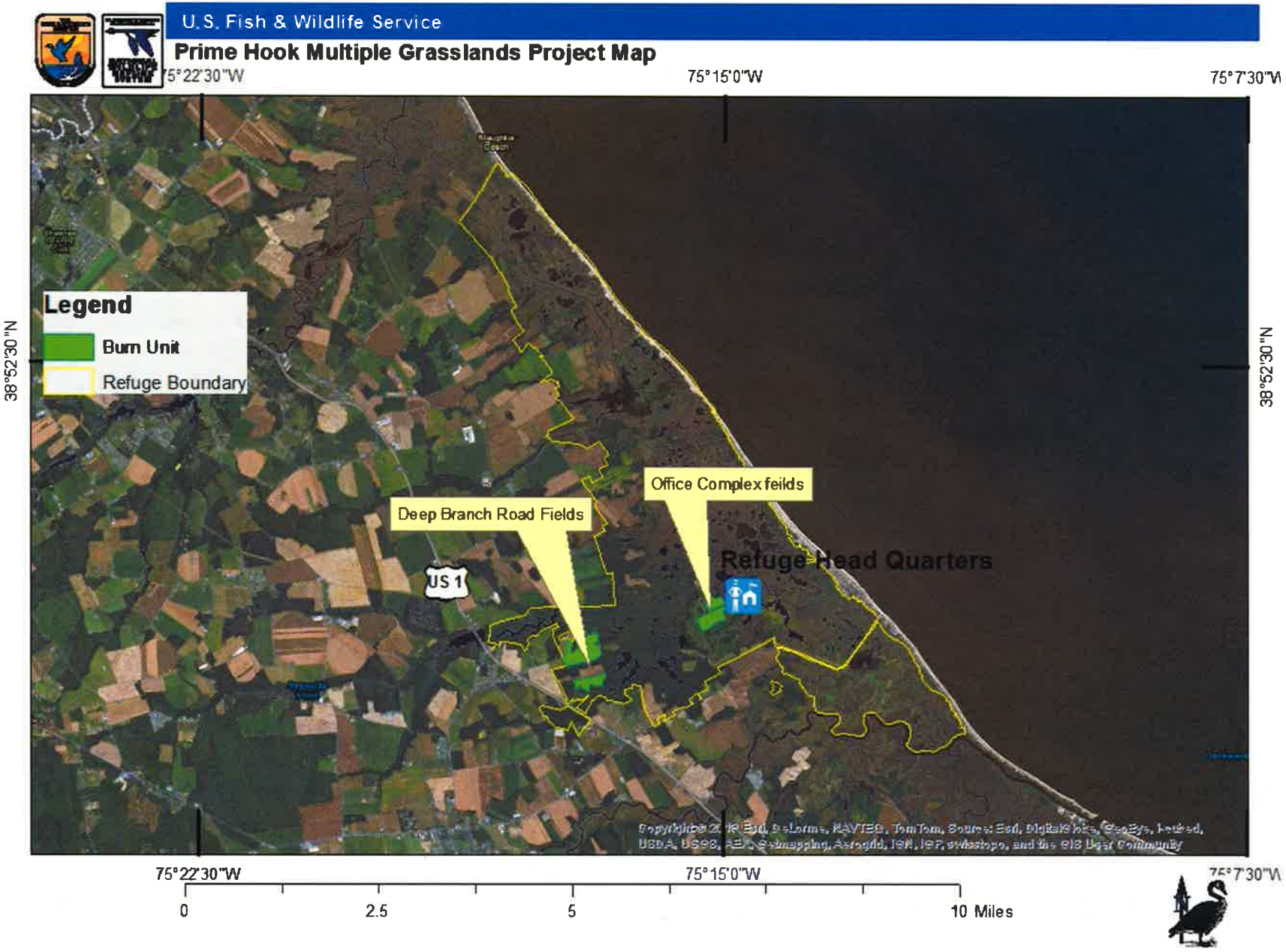
An after-action-review (AAR) is usually completed immediately after the burn. Any comments/or concerns that need to be resolved should be included in the burn package documentation and discussed with the zone FMO.

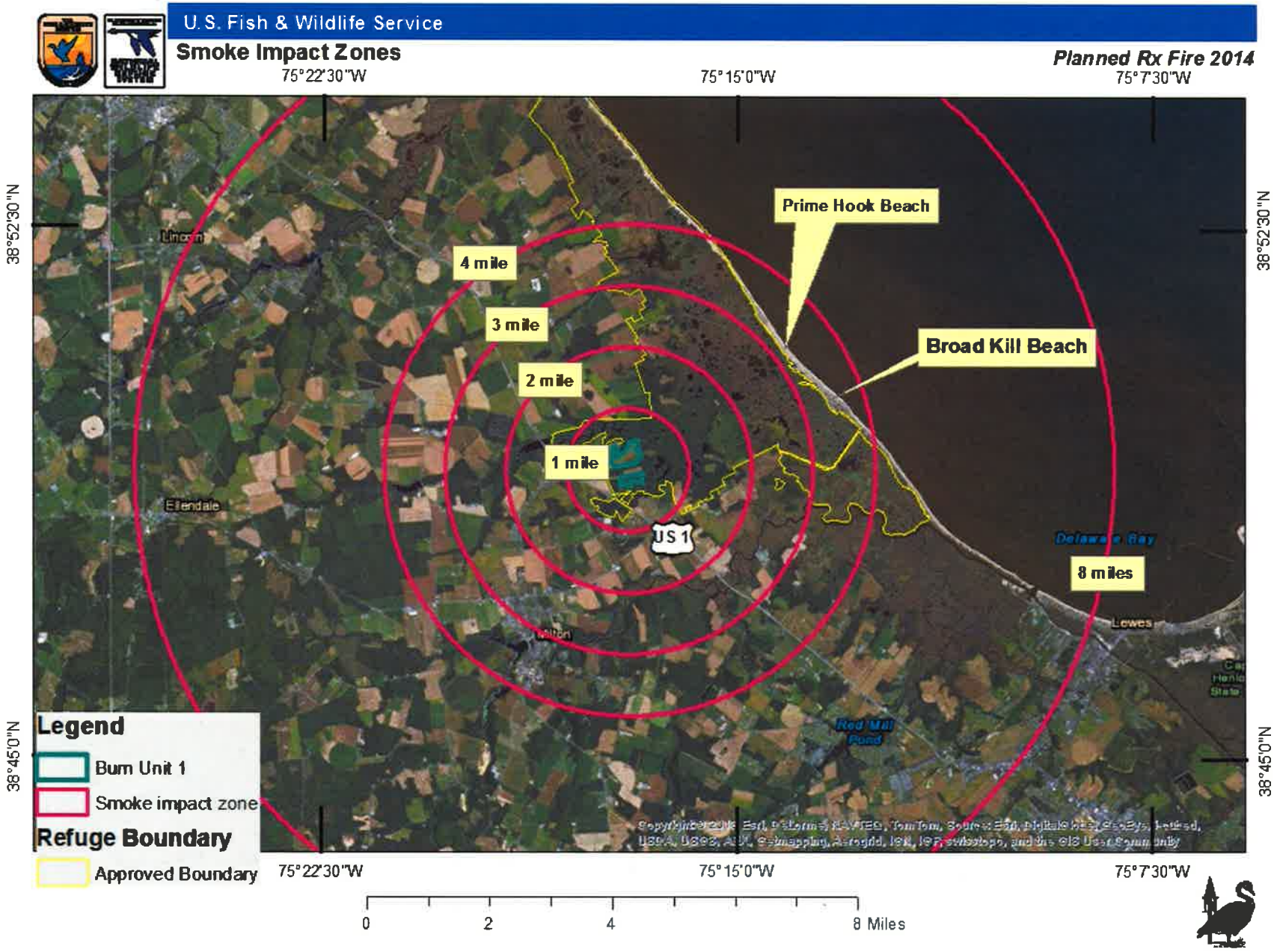
APPENDICES

A. Maps
B. Technical Review Checklist
C. Complexity Analysis
D. Job Hazard Analysis
E. Fire Behavior Modeling Documentation or Empirical Documentation
F. Patrol Log

Prime Hook NWR Vacinity Map

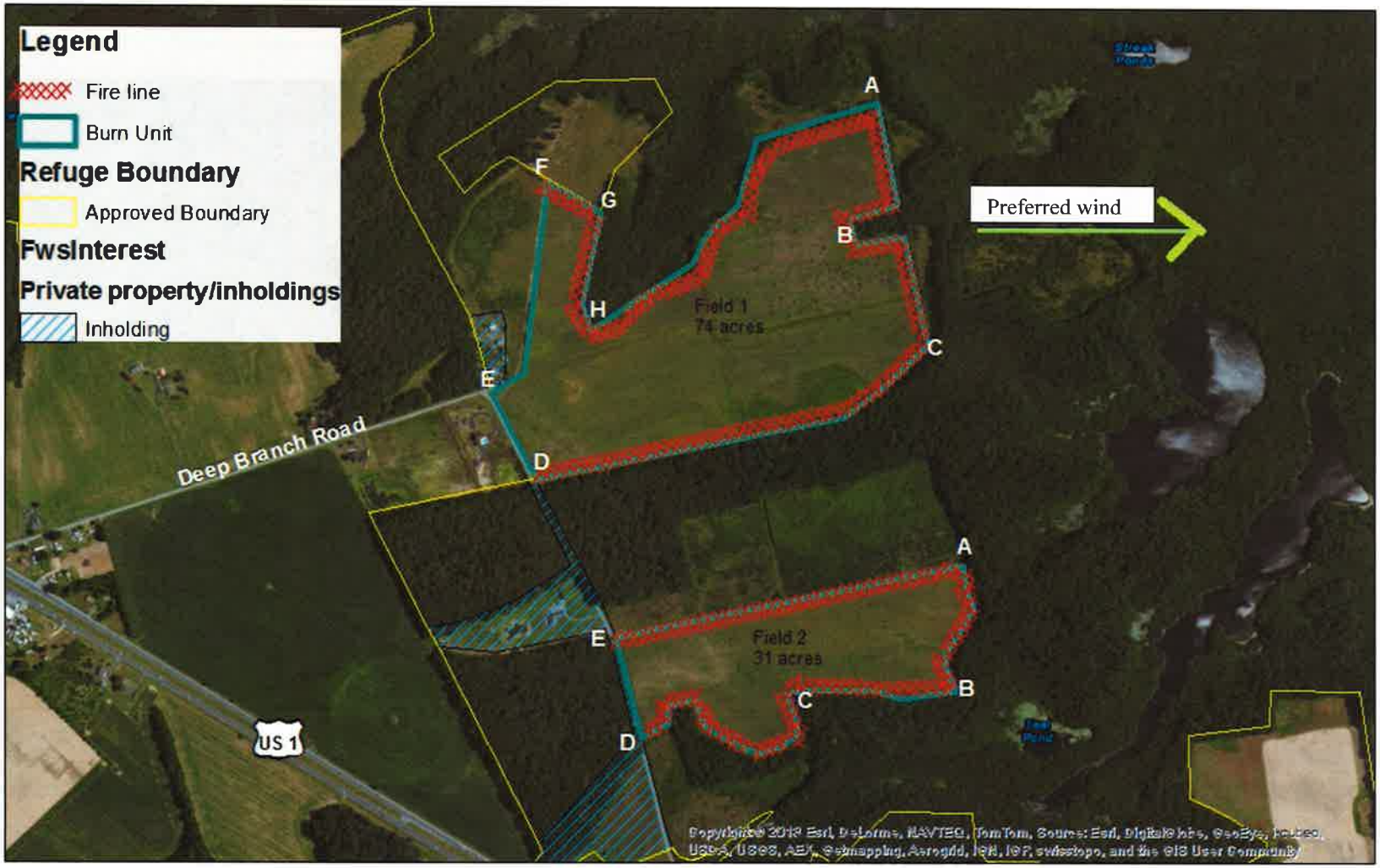



U.S. Fish & Wildlife Service
Prime Hook Multiple Grasslands Project Map
75°22'30"W
75°15'0"W
75°7'30"W
38°52'30"N
Legend
Burn Unit
Refuge Boundary
Office Complex feilds
Deep Branch Road Fields
Refuge Head Quarters
US 1
0
2.5
5
10 Miles


U.S. Fish & Wildlife Service
Smoke Impact Zones
Planned Rx Fire 2014
75°22'30"W
75°15'0"W
75°7'30"W
38°52'30"N
38°45'0"N
Prime Hook Beach
Broad Kill Beach
4 mile
3 mile
2 mile
1 mile
8 miles
US 1
Lincoln
Ellendale
Milton
Lewes
Delaware Bay
Red Mill Pond
Legend
Burn Unit 1
Smoke impact zone
Refuge Boundary
Approved Boundary
0
2
4
8 Miles

U.S. Fish & Wildlife Service

Project Map Deep Branch Road Fields



U.S. Fish & Wildlife Service

Prime Hook office complex fields Project Map

Appendix B: Technical Reviewer Checklist

Fill out this checklist based on the guidance provided in the Technical Review section in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484.

Rate each element in the following table with an "S" for Satisfactory or "U" for Unsatisfactory. Use Comment field as needed to support the element rating.

PRESCRIBED FIRE PLAN ELEMENTS	RATING	COMMENTS
1. Signature page		
2. A. Agency Administrator Ignition Authorization, PMS 485		
2. B. Prescribed Fire GO/NO-GO Checklist, PMS 486		
3. Complexity Analysis Summary		
4. Description of Prescribed Fire Area		
5. Objectives		
6. Funding		
7. Prescription: Prescription Narrative and Prescription Parameters		
8. Scheduling		
9. Pre-Burn Considerations and Weather		
10. Briefing		
11. Organization and Equipment		
12. Communication		
13. Public and Personnel Safety, Medical		
14. Test Fire		
15. Ignition Plan		
16. Holding Plan		
17. Contingency Plan		
18. Wildfire Declaration		
19. Smoke Management and Air Quality		
20. Monitoring		
21. Post-Burn Activities		
Appendix A: Maps		
Appendix C: Complexity Analysis		
Appendix D: Agency-Specific Job Hazard Analysis or Risk Assessment		
Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation		
Appendix F: Smoke Management Plan and Smoke Modeling Documentation (Optional)		
Other		

☐ **Approval is recommended** subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

☐ **Recommendation for approval is not granted.** Prescribed fire plan should be re-submitted for technical review subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

Technical Reviewer Signature: _____ Qualification and Currency: _____

Date Signed:_____

Reason(s) for non – approval and follow-up required for approval:

APPENDIX C
Prescribed Fire Complexity Rating System Guide Worksheet

Project Name **Prime Hook Grasslands**
Prescribed Fire Unit: **Multiple fields**

Complexity elements:

1. Potential for Escape

Risk	**Rationale**
Preliminary Rating: ***Low (Moderate) High***	Some likelihood of a few small spot fires that are easily detected and controlled. Ignition procedures do not create intense fire. Any dangerous ladder fuels or concentrations near critical holding points will be removed prior to ignition. No residual fire beyond day of ignition due to mop up.
Final Rating: ***(Low) Moderate High***	Mowed borders, hoselays, or ATV wet lines and constant patrols will catch any small spots. Ignition techniques will limit amount of perimeter exposed at any given time. Potentially, lines may also be raked prior to burn day if feasible.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low (Moderate) High***	The scope of the burns is such that an escape fire poses little adverse consequence, based on light fuel loads, flat terrain, and availability of water. An escaped fire would have cause little damage to surrounding resource values.
Final Rating: ***Low (Moderate) High***	Prescribed wind directions will mitigate smoke problems. Contingency resources readily available with short response time. In the event of a wind shift, the only impact to public would be smoke on the Coastal Highway 1. and adjacent homes.
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Holding operations supervised at Single Resource level. Burn unit and surrounding area easily accessible to holding forces. All key personnel are local and familiar with fuel types and environmental factors.
Final Rating: ***(Low) Moderate High***	No change

2. The Number and Dependency of Activities

Risk	**Rationale**
Preliminary Rating: ***Low (Moderate) High***	Ignition and holding activities are dependent upon a reliable source of water for containment at all times. Communications between forces vital.
Final Rating: ***(Low) Moderate High***	Back up pump and spare hoses will be on scene prior to ignition. All personnel will have visual as well as radio communications. Close attention will be paid to coordinating timing of refills for ATV sprayer tanks and engines.
Potential Consequences	**Rationale**

Preliminary Rating: ***Low (Moderate) High***	Water supply problems result in increased risk of escape, and threaten project completion. Coordination issues problems could result in failure to meet some project objectives, or create a safety issue.
Final Rating: ***(Low) Moderate High***	Supply problems mitigated by having hand tools on the line and by adjusting firing to coordinate with refill needs so no active line are left unprotected. Failure to accomplish burn has no long term resource effects due to availability of other treatment methods such as mowing or fall burning.
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Small holding force, highly skilled (most casuals, if used, are experienced members of local fire departments), require little supervision. Terrain allows visual contact for most of the units. Phone and radio operations will be checked prior to any ignition.
Final Rating: ***(Low) Moderate High***	No change.

3. Off-Site Values

Risk	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	No values or improvements in immediate surrounding area that would be conceivably affected. Minimal visitor use. Risk to private lands or improvements in extended area negligible.
Final Rating: ***(Low) Moderate High***	Any risk to the extended area is mitigated by the prescribed wind directions and contingency planning.
Potential Consequences	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Visitor use to the area would not be restricted except during actual burn inception. Any escape should be limited to a ground fire and do little resource damage. The vegetation potentially affected generally has rapid recovery rates.
Final Rating: ***(Low) Moderate High***	No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Protection of surrounding area requires no special equipment or skills. Containment can be accomplished with ATV's and hand tools or by installing hoselays if necessary. There are several forest openings downwind that could be used as contingency breaks, these will be identified during briefing.
Final Rating: ***(Low) Moderate High***	No change.

4. On-Site Values

Risk	Rationale
Preliminary Rating: ***(Low) Moderate High***	No on-site values at risk other than surrounding forest which is easily protected
Final Rating: ***(Low) Moderate High***	No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Trees are large enough to survive fire but not ecologically important to resource goals if they are lost.
Final Rating: ***(Low) Moderate High***	No change
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Trees are easily protected by wetting down prior to ignition and having fuel scraped away from base if needed. Power poles will be wet down around prior to ignition.
Final Rating: ***(Low) Moderate High***	No change.

5. Fire Behavior

Risk	Rationale
Preliminary Rating: ***Low (Moderate) High***	Fuels are uniform and/or loading is light and can be characterized using a single fuel model (FM3). Terrain is relatively flat, winds and other fire conditions fairly uniform. As with all prescribed fire there is a danger to personnel.
Final Rating: ***(Low) Moderate High***	Prescription values, contingency planning, and ignition techniques will all mitigate potential problems. Using LCES hazards to personnel can be mitigated.
Potential Consequences	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Fire behavior in the shaded area outside the units would be much less than in the units. BEHAVE runs indicate that any escape could be handled with the resources on hand.
Final Rating: ***(Low) Moderate High***	No change. An escape outside the Riparian area would have significantly less behavior in the hayed field.
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Standard precautions adequate for personnel safety. Holding forces can control most or all spot fires using direct attack with no additional resources needed given the expected escaped fire behavior. Required fire behavior to meet objectives easily created and controlled.
Final Rating: ***(Low) Moderate High***	Backup pump and hoses on site will further ensure ability of on scene resources to catch any spot.

6. Management Organization

Risk	Rationale
Preliminary Rating: ***(Low) Moderate High***	A small number of qualified people consisting of RXB2, Ignition Specialist, and three to five person holding crews with one FFTR 1 qualified are required to implement the prescribed fires. Single level of supervision adequate.
Final Rating: ***(Low) Moderate High***	RXB2 with minimum single resource boss qualifications will have no span of control issues
Potential Consequences	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Qualified and experienced personnel, no problems related to supervision or communication expected. Trainee positions may be filled where applicable without affecting management.
Final Rating: ***(Low) Moderate High***	No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	All team members available within local area and familiar with local factors affecting project implementation. Extra personnel if needed could come from Delaware Forest Service or Milton Fire Department.
Final Rating: ***(Low) Moderate High***	No change. Majority of members, regardless of affiliation, have worked together before on similar refuge burns. Interagency relations and communications are excellent.

7. Public and Political Interest

Risk	Rationale
Preliminary Rating: ***(Low) Moderate High***	Units are in a rural area and are relatively small in size. Little or no interest (other than public support of resource goals) or controversy related to project at any of the times it has been previously burned.
Final Rating: ***(Low) Moderate High***	No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	Unexpected events such as smoke on the road or spot fires would attract very little attention as field burning is common in this area.
Final Rating: ***(Low) Moderate High***	A news release will be issued prior to the start of burn season.
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	No special notifications or releases needed other than normal contacts made before all burns to local fire department, adjacent landowners, and Delaware Forest Service. Requires no special fire information function. Sufficient public notification will be made by staff in the form of news releases in local papers prior to burning.
Final Rating: ***(Low) Moderate High***	No change.

8. Fire Treatment Objectives

Risk	Rationale
Preliminary Rating: *(Low) Moderate High*	Objectives limited to easily achieved hazard fuel reduction and for maintenance of open early successional grass communities. Necessary low to moderate intensity fire behavior easily created and managed.
Final Rating: *(Low) Moderate High*	No change. Both weather and fire behavior monitoring are expected to be easily conducted.
Potential Consequences	**Rationale**
Preliminary Rating: *(Low) Moderate High*	Other management activities not dependent on completion of project. Failure to fully meet objectives has no adverse impact on resource in the short term. Several opportunities will exist to meet the objective.
Final Rating: *(Low) Moderate High*	No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *(Low) Moderate High*	Objectives achievement is relatively easy to complete using wet containment lines. Also, there is no restriction on techniques and limited pre burn monitoring is needed to ensure prescription is met.
Final Rating: *(Low) Moderate High*	Containment lines and contingencies have been addressed in burn plan and will be sufficient.

9. Constraints

Risk	Rationale
Preliminary Rating: *(Low) Moderate High*	Water supply is readily available. A second source and second pumping system will be needed for contingency backup.
Final Rating: *(Low) Moderate High*	Spare pump will be on site along with 200 gal. engine. The major factor will be personnel experience coordinating firing and timing of ATV refill runs. Prescription limits will also help constrain fire behavior.
Potential Consequences	**Rationale**
Preliminary Rating: *Low (Moderate) High*	Project can be implemented whenever it is in prescription. Serious consequences could result in the event of smoke impacting Highway 1but unlikely due to prescribed wind directions.
Final Rating: *(Low) Moderate High*	Smoke impacts will be mitigated by using signs or marked fire vehicles, or by terminating ignition and extinguishing all smokes.
Technical Difficulty	**Rationale**
Preliminary Rating: *(Low) Moderate High*	There are no constraints that will increase the difficulty of this project beyond minimal RXB2 capabilities. Fire lines and holding plans are already in place and have proven effective on these units during past burns.
Final Rating: *(Low) Moderate High*	No change.

10. Safety

Risk	Rationale
Preliminary Rating: *(Low) Moderate High*	Safety issues and hazards easily identifiable and addressed in briefing. ATV operators will be fully trained and experienced in operating with loaded tanks. Pump and/or chainsaw operators will be certified and have PPE.
Final Rating: *(Low) Moderate High*	No change. Smoke concerns addressed elsewhere.
Potential Consequences	**Rationale**
Preliminary Rating: *(Low) Moderate High*	Minimal potential for serious injuries to firefighters. All PPE to be worn, escape routes and safety zones are easily accessible. All personnel meet NWCG qualifications.
Final Rating: *(Low) Moderate High*	No change. By adhering to the 10 standard fire orders, 18 watch outs, implementing LCES, and receiving a good briefing, all hazards to firefighters can be mitigated. Public safety mitigation discussed above.
Technical Difficulty	**Rationale**
Preliminary Rating: *(Low) Moderate High*	Safety briefing will be conducted pre ignition as part of the project briefing and risks will be mitigated with LCES.
Final Rating: *(Low) Moderate High*	No change.

11. Ignition Procedures/Methods

Risk	Rationale
Preliminary Rating: *(Low) Moderate High*	Firing sequence not critical to project objectives. Entire burn unit readily visible to Burn Boss. Firing methods to limit fireline intensities and threat to control.
Final Rating: *(Low) Moderate High*	No change. Firing will be adjusted to allow for ATV refill needs.
Potential Consequences	**Rationale**
Preliminary Rating: *(Low) Moderate High*	Firing methods do not pose safety risks or increase risk of adverse events. Escaped fire would be easily caught and have no long term impact to the resource.
Final Rating: *(Low) Moderate High*	No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *(Low) Moderate High*	Simple firing procedure, small ignition team, no special equipment or techniques. All ignition done with drip torches or ATV torch. Standard strip-fire techniques will be employed requiring minimal supervision of the lighters to achieve project objectives and manage safety concerns.
Final Rating: *(Low) Moderate High*	No change.

12. Interagency Coordination

Risk	Rationale
Preliminary Rating: *Low (Moderate) High*	Project does not have to involve other jurisdictions or agencies in order to be completed. No concerns identified with partners such as Milton Fire Department or Delaware Forest Service other than adjacent lands and mitigation if there is an escape.
Final Rating: *(Low) Moderate High*	Refuge has worked with both partners before so expect no major problems.
Potential Consequences	**Rationale**
Preliminary Rating: *Low (Moderate) High*	Project may be completed as planned. In the event of an escape, we could have any number of FD members assisting in suppression with varying degrees of training and no clear chain of command.
Final Rating: *Low (Moderate) High*	No change. By notifying departments before burning we can educate them on our intentions and the roles they may have but still a concern.
Technical Difficulty	**Rationale**
Preliminary Rating: *(Low) Moderate High*	All required agency notifications will be made as per burn plan. Common communication frequencies determined in pre-suppression agreements. Refuge has history of working with cooperating agencies.
Final Rating: *(Low) Moderate High*	No change.

13. Project Logistics

Risk	Rationale
Preliminary Rating: *(Low) Moderate High*	All logistical aspects of burn can be handled and provided on station or from immediate area. No special needs identified.
Final Rating: *(Low) Moderate High*	No change.
Potential Consequences	**Rationale**
Preliminary Rating: *(Low) Moderate High*	Problems related to logistics should not increase risk of escape or create safety concerns.
Final Rating: *(Low) Moderate High*	No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *(Low) Moderate High*	No special support needs. Supplies and personnel readily available at refuge level or in the local area..
Final Rating: *(Low) Moderate High*	No change.

14. Smoke Management

Risk	Rationale
Preliminary Rating: ***Low (Moderate) High***	Project will produce smoke for short period of time. Smoke visibility should not be a public concern due to the burning that goes on throughout the area in the spring. Smoke impacts to roads has serious consequences. Firefighter health and safety a concern.
Final Rating: ***Low (Moderate) High***	All burns that have the potential to hamper visibility on public roads will be signed and monitored as discussed previously. The duration of smoke will not be significant enough to warrant public health and safety concerns. Firefighters will be rotated out of heavy smoke concentrations as needed.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low (Moderate) High***	Weather forecasts will be closely monitored to ensure prescribed wind directions. Smoke signs will be posted along road if deemed necessary by burn boss. If smoke were to reduce visibility on Highway 1 this could cause major traffic accidents or backups if the road had to be shut down due to smoke.
Final Rating: ***Low (Moderate) High***	Only burning the Deep Branch road units with westerly winds will greatly reduce any risk of smoke impacts to highway 1. However if there was a sudden wind shift and the fire could not be extinguished quickly immediate measures would have to be taken to prevent accidents or traffic issues.
Technical Difficulty	**Rationale**
Preliminary Rating: ***(Low) Moderate High***	No special operational procedures are required by the state of Delaware other than obtaining a burn permit through local appointed Fire Warden and to burn under such conditions as to not create a nuisance. Limitations on ignition time, minimum transport wind speed and mixing height are present in the prescribed burn plan to address smoke concerns.
Final Rating: ***(Low) Moderate High***	No change.

COMPLEXITY RATING SUMMARY- **Prime Hook Grasslands**

RISK	OVERALL RATING MODERATE
POTENTIAL CONSEQUENCES	OVERALL RATING MODERATE
TECHNICAL DIFFICULTY	OVERALL RATING LOW
SUMMARY COMPLEXITY RATING	**MODERATE**

RATIONALE: The overall complexity rating for these units is moderate. The Risk, Potential Consequences, and Technical Difficulty are all capable of being mitigated however the consequences of smoking out Coastal Highway 1 to the west are still the main concern. Based on the required winds and prescription parameters to burn these units the fires can be conducted safely and efficiently.

A person meeting RXB2 qualifications as determined by the agency is capable of implementing this plan. Suppression (holding) requires an individual meeting FFT1 qualification. The availability of experienced local personnel makes the job of the burn boss much easier and allows personnel to fill more than one position as needed. Excellent relationships with Milton Fire Department and Delaware Forest Service make any coordination issues simple to address.

Prepared by: _____ Date: 02/25/2012
Art Canterbury, Zone Fire Management officer

Approved by: _____ Date: _____
(Agency Administrator)

U.S. Department of the Interior	1. WORK PROJECT/ACTIVITY	2. LOCATION	3. UNIT
Fish and Wildlife Service	**Prescribed Fire**	**Various**	**MD-BWR**
JOB HAZARD ANALYSIS (JHA)	4. NAME OF ANALYST	5. JOB TITLE	6. DATE PREPARED
Interagency Stds. For Fire and Fire Aviation Operations "Red Book" (Instructions on Reverse)	**G-Vickers**	**FMS.**	**1/8/13**
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE	
*Travel to and from project site.	Motor vehicle accidents Slippery road surfaces,soft shoulders,unimproved and narrow roadways. Weather darkness,smoke.	Driving Defensively. Use seat belts. Identify road conditions during briefings. Post Road Guards. Mark hazards. Use Headlights. Perform preuse inspections on equipment. Scout roads and identify turnouts before ignition of project. Maintain communications. Provide road system map for project. Use Backers and chock vehicle tires. Have vehicles facing out.	
Travel to and from project site	Boat travel. Trailering, launching and retrieving boats.	The dangers of hypothermia resulting from getting wet from falling overboard, or simply falling over your boots, is very real. Boat operations require that Coast Guard requirements are met, including PPE. Prompt action to recover personnel and get them to where they can get out of wet clothes and into a dry and warm environment is crucial. Pulling boat trailers and operating watercraft requires DOI certification	
*Qualifications For assigned Position	Lack of Experience Injuries	Workers recruited for burn assignments shall meet age,health, and physical requirements established for regular firefighting duties.(Interagency Stds. For Fire and Fire Aviation Operations) Also meet Prescribed Burn qualifications.	
*Briefing	Lack of communications	Provide project briefing before burning will clarify firing order, organization responsibilities, communications, hazards, weather, and expected fire behavior.	
*Protective Clothing and equipment	Injuries,burns and death	Wear Hard hat with chin strap, safety glasses, Nomex Fire resistant pants and shirts NFPA 1977 compliant. Keep sleeves rolled down. Wear leather,lace type, boots with skid resistant soles, and tops at least 8 inches high. Carry drinking water and fire shelter. Wear OSHA approved firefighting gloves. wear hearing protection when working around equipment where noise level exceeds 90 dba. *Wear additional protective equipment as dictated by local conditions and exposure to special equipment*. For example: hip waders and cold weather gear.	
*Lighters	Injuries and death falls,snags,bees, snakes,smoke, burns, rolling material.	Always have an escape route . Maintain LCES. Follow the Standard Fire Orders and Watch Out Situations. Maintain communications with other lighters and RX Fire Ignition specialist. Hand held radios shall be provided to all lighters. Do not fill drip torches near ignition sources. Do not spill burn mix on clothing.	
*Fuel Mixing	Burns, spills, fuel saturated clothing and boots.	No smoking within 25 feet of mixing and filling area. Do not fill or mix in pick up beds with bed liners. Avoid the use of cellular telephones in and around fill or mixing area. Avoid fuel contact with bare hands, clothing and boots. Provide pour spouts. Use	

		only approved fuel containers. Follow fuel mixture ratio in the Health and safety Code Handbook.
*Holding/Mop Up/Patrol Crews	Smoke,burns,Falls, back injuries, bees, posion oak,snags, rolling material,eye injuries. Heat Stress. Dehydration CO Poisoning	Wear PPE listed above. LCES, Follow Standard Fire Orders and Watch out Situations. Receive briefing from Holding and Mop Up Boss. Identify hazards in work area. Flag hazards for others. Use warning lights and provide traffic control on roadways during smoky and nights operations. Maintaining a high level of aerobic fitness is one of the best ways to protect yourself against heat stress. Drink lots of fluids before,during and after work. Periodically rotate crews from work sites with high smoke levels to areas of less smoke or smoke free areas. Protective clothing and equipment shall be the same as required for firefighting. Crews shall follow all guidelines in the NWCG Fireline Handbook Chapter 5 Firefighting Safety (Rev. 9/98). Maintain communications with the ECC.

*Emergency Evacuation Procedures (EEP)	Serious illness injuries	Notifydispatch and/or contact county through 9-1-1, request medical response from the responsible medical first responders. Provide type of injury,location,access, number of patients. Follow 9-1-1 protocol. On site engines shall have BLS equipment to initiate basic life support until responsible medical first responders arrive. Identify EMT's and available medical equipment on project during briefing.	
10. LINE OFFICER SIGNATURE		11. TITLE	12. DATE

JHA and Emergency Evacuation Procedures Acknowledgment

We, the undersigned work leader and crew members, acknowledge participation in the development of this JHA (as applicable) and accompanying Emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents.

SIGNATURE	DATE	SIGNATURE	DATE

APPENDIX E
Behave Runs

BehavePlus 3.0.1 (Build 261)

Short Grass-Head Fire
February 26, 2014

Input Worksheet

Modules: SURFACE, SPOT

Input Variables	Input Value(s)	Units
Fuel/Vegetation, Surface/Understory		
Fuel Model	1	
Fuel/Vegetation, Overstory		
Canopy Height	2	ft
Fuel Moisture		
1-h Moisture	3, 6, 9, 12	%
10-h Moisture		%
100-h Moisture		%
Live Herbaceous Moisture		%
Live Woody Moisture		%
Weather		
20-ft Wind Speed (upslope)	5, 8, 11, 14, 17, 20	mi/h
Wind Adjustment Factor	0.4	
Terrain		
Slope Steepness	0	%
Ridge-to-Valley Elevation Difference	0	ft
Ridge-to-Valley Horizontal Distance		mi
Spotting Source Location		

Notes

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always

for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Results for: Surface Rate of Spread (maximum) (ch/h)

1-h	20-ft Wind Speed (upslope)					
Moisture	mi/h					
mi/h						
3	22.4	50.6	92.8	149.5	220.9	307.2
6	17.6	39.8	73.0	117.6	173.8	241.6
9	13.1	29.6	54.4	87.6	129.5	135.7
12	0.0	0.0	0.0	0.0	0.0	0.0

Results for: Flame Length (ft)

1-h	20-ft Wind Speed (upslope)					
Moisture	mi/h					
mi/h						
3	2.5	3.7	4.8	6.0	7.2	8.4
6	2.1	3.1	4.1	5.1	6.1	7.1
9	1.7	2.5	3.3	4.1	4.9	5.0
12	0.0	0.0	0.0	0.0	0.0	0.0

Results for: Spot Dist from Wind Driven Surface Fire (mi)

1-h	20-ft Wind Speed (upslope)					
Moisture	mi/h					
mi/h						
3	0.1	0.1	0.2	0.3	0.3	0.4
6	0.1	0.1	0.2	0.2	0.3	0.4
9	0.1	0.1	0.1	0.2	0.2	0.3
12	0.0	0.0	0.0	0.0	0.0	0.0

End

Tall grass-head fire
February 26, 2014

Input Worksheet

Modules: SURFACE, SPOT

Input Variables	Input Value(s)	Units
Fuel/Vegetation, Surface/Understory		
Fuel Model	3	
Fuel/Vegetation, Overstory		
Canopy Height	3	ft
Fuel Moisture		
1-h Moisture	3, 6, 9, 12	%
10-h Moisture		%
100-h Moisture		%
Live Herbaceous Moisture		%
Live Woody Moisture		%
Weather		
20-ft Wind Speed (upslope)	5, 8, 11, 14, 17, 20	mi/h
Wind Adjustment Factor	0.4	
Terrain		
Slope Steepness	0	%
Ridge-to-Valley Elevation Difference	0	ft
Ridge-to-Valley Horizontal Distance		mi
Spotting Source Location		

Notes

This run will cover all marsh grass burns, burning as a head fire.

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always

for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Results for: Surface Rate of Spread (maximum) (ch/h)

1-h	20-ft Wind Speed (upslope)
Moisture	mi/h

mi/h	5	8	[illegible]	[illegible]	[illegible]	[illegible]
3	52.3	91.7	136.0	184.3	235.9	290.5
6	38.6	67.6	100.3	135.9	174.0	214.3
9	31.6	55.4	82.2	111.4	142.6	175.6
12	27.8	48.7	72.3	98.0	125.4	154.4

Results for: Flame Length (ft)

1-h	20-ft Wind Speed (upslope)					
Moisture	mi/h					
mi/h	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	10.1	13.1	15.7	18.0	20.2	22.2
6	8.0	10.4	12.5	14.3	16.0	17.7
9	7.0	9.1	10.9	12.5	14.0	15.4
12	6.5	8.4	10.1	11.6	13.0	14.3

Results for: Spot Dist from Wind Driven Surface Fire (mi)

1-h	20-ft Wind Speed (upslope)					
Moisture	mi/h					
mi/h	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	0.2	0.3	0.4	0.5	0.7	0.8
6	0.2	0.3	0.4	0.5	0.6	0.7
9	0.1	0.2	0.3	0.4	0.5	0.6
12	0.1	0.2	0.3	0.4	0.5	0.6

End

Appendix F:

Post Burn Patrol log	**PROJECT NAME:**	**Prime Hook Grasslands**		
	BURN UNIT NAME:			
	POST BURN PERIOD PATROL LOG			
PATROL DATE: **PATROL TIME:**				
# DAYS SINCE BURN UNTIL MOISTURE RECEIVED				
PRECIPITATION AMOUNT				
PRECIPITATION DURATION (HRS)				
WIND DIRECTION & SPEED				
OBSERVED PRESENCE OF NEEDLE CAST? Yes or No				
SMOKE – FOG POTENTIAL (index)				
1000 HOUR FUEL MOISTURE (from closest weather station)				
KEECH BYRAM DROUGHT INDEX				
ESTIMATED AREA OF ACTIVE FIRE				
PRESENCE OF GROUND FIRE? Yes or No				
VISIBILITY ON ROADWAYS (Distance)				
SMOKE SENSITIVE TARGETS IMPACTED? Yes or No				
INITIALS OF PATROLLER				

Environmental parameters discussion, or description of empirical evidence utilized:

Documented patrol information: